Online Learning: An Overview

Bryan Walker [1*],

[1]Independent Consultant, Thailand.
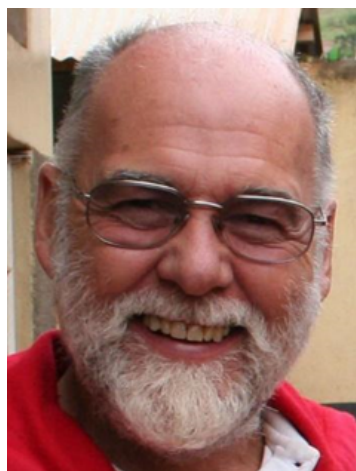
Bryan Walker BSc MSc PhD CBiol FRSBiol FRSM has followed careers in industry, hospitals, academia and education, the civil service and humanitarian work. After being Head of a UK University Department of Pharmacology for 15 years he was appointed as one of Her Majesty's Inspectors of Further and Higher Education. With the University of London Teaching Methods Unit, he provided training for new teachers and organised many other workshops in Africa, Asia and Europe. He has given more than one hundred invited lectures around the world and been elected to Life Fellowships of The Royal Society of Biology and The Royal Society of Medicine for his research.

For three years he set up and directed the Birth Research Unit in Sri Lanka; over half the communications to learned societies received national or international awards. After working for people with disabilities in Uganda he relocated to Thailand to continue his humanitarian work.

Abstract

During the coronavirus pandemic, the lockdown of organisations, schools and universities has forced people to spend more time at home. For business necessity, occupational therapy, education and entertainment adults and children spend more of their waking hours using the Internet. Of longer-term significance we do not know what the job market will look like in future years; today we have little idea of primary and secondary learning needs. Much of what is currently taught may be irrelevant for future occupations. This review exemplifies what can be achieved in confinement with only a computer and connection to the Internet.

Although the high cost of hardware and software for connection to the Internet may be offset by reduced transport and travel, there are other risks associated with increased hours spent looking at a screen. The many intellectual and social skills, such as team working, leadership, debating and problem-solving abilities, earlier acquired through school playground games, social working and other communal situations, may become underdeveloped. Inadequate attention to appropriate ergonomics can result in damage to or impairment of posture, sight and other physical and mental health characteristics.

Traditionally, life has been divided into two main parts: a period of learning followed by a period of working. Soon the traditional model may become obsolete, and the only way for humans to stay in employment will be to continue learning or to re-school themselves repeatedly. Limitations of finances and time will increase the demand for low-cost or free Online Learning courses.

Keywords: Online Learning, Covid-19, Internet, Education

1.   INTRODUCTION

Online Learning involves the use of the Internet to access courses constructed by educational establishments for this purpose. Fifty years ago, the author recorded his lectures and those of others so that students could use the tapes for learning and revision. This pre-dated the use of computers for such a purpose. Since then, several organizations have adopted and developed the approach. Synchronous courses are live online courses that are conducted in real-time while asynchronous courses are composed of prebuilt course components, allowing students to complete them at the time and pace of their choosing. While there are many courses that can be taken in a self-phased manner, there are others that have to be taken in the same manner as if attending a university. Attendance is marked, participation is monitored and there are penalties:

inadequate hours disallow examination. Teaching may be conducted through virtual classes by the use of Skype, Zoom and other conference arrangements.

A new academic year, a new school, the start of university or another course or semester are all exciting events. However, they may mean increased costs for courses, books, uniforms, equipment and travel. The uncertainty of employment after the new schooling raises doubts and concerns in the minds of those responsible for the overall expenses of the new experience; a search may be made for cheaper solutions that can achieve the same end.

For those who had time for full-time learning, it has been offered free by some universities for students from selected countries, but such people may need finances to cope with local living costs.

USA, Finland, Norway, and Germany have been some of the most popular destinations for international students. Students may be drawn to these countries by free-tuition policies (or the availability of scholarships), high-quality education standards and institutions, and the importance universities place on research and practical training. These countries offer over 500 Bachelor's and 2,100 Master's degrees. The high standards of their study programmes are confirmed by international rankings, which list them among the best in the world.

Because of current universal lockdowns, millions of people around the globe will be going 'back to school' without leaving their front doors. Few recent trends have caught on quite like online learning, which is rising at an unprecedented rate. The hundreds of free courses offered by elite universities on 'tech-ed' sites seem to herald a future in which world-class education becomes available to anyone with a reasonable broadband connection and a desire to learn. Recently, the Economist (Bonk, Lee & Reeves, 2015) suggested that the Massive Open Online Course (MOOC) is changing academia's "ivory towers". A survey by the Sloan Consortium (2013) found that enrolment in Online Learning enjoys a 21% growth rate, compared with the paltry two per cent in higher education overall.

Consider one example of facts and figures relating to the Open University (OU) in the UK (2020). It offers more than 1,000 free Online Learning courses in addition to the other fee-paying programs. (This information was taken directly from its website).

The Open University in facts and figures

Since OU's launch in 1969, almost 1.8 million people worldwide have achieved their learning goals by studying with us.

The OU is the largest academic institution in the UK, in terms of student numbers. It has:

- *more than 240,000 students*
- *close to 7,000 tutors*
- *more than 1,100 full-time academic staff*
- *more than 3,500 support staff*

The UK university is also European and worldwide as

Open University students are not just in the UK. Most courses are available throughout Europe and some are available worldwide directly from the OU. Many more courses are available through their partnerships and accredited institutions.

- *The Open University has 15 curriculum partnerships established in 23 countries*

The OU outside the UK

Who are the OU's students?

Our students come from the widest possible range of backgrounds. We have students who are in their teens, including some Year 12 and 13 school students who are studying OU courses alongside A-levels. We have students in their 90s - and all ages in between. We are the largest provider of higher education for people with disabilities:

We are opening up opportunities for lower-income groups. Our open admissions policy helps thousands of people who failed to achieve their potential earlier in life:

- *45% of students had one A level or lower qualification at entry*

Thousands of people, who might not have been able to study because of work or family commitments, can study part-time with us:

- *Over 71% of OU students work full or part-time during their studies*

2. METHODS

The emergency and disaster challenges faced by humanity, including the current COVID-19 pandemic, have clearly demonstrated the power of community resilience in maintaining human existence, promoting health and wellbeing, sustaining economic prosperity, and developing schooling. Community resilience is the ability of communities to face and recover from challenges using their own resources.

The resource used for most of the research for this paper was a 5-year-old Dell laptop computer with erratic local (Thailand) Wi-Fi access. The computer finally was unable to update current software and its battery failed. It was replaced with a Dell G3 15 laptop with a 15.6-inch screen. Windows 10 and Microsoft Office were installed. The Wi-Fi was improved by the installation of a 3BB system with 5GB provision that easily facilitated the conclusion of the research.

The browser that was used throughout the study period for access to the Internet was Google Chrome. No visits were made to any library or other physical resource locations.

Spelling and grammar checking used the free version of Grammarly (2020): Grammarly versions are used by 30 million people.

Key research words included the following: Online Learning, computer learning, distance education, e-modules, courses, Internet

education, open learning, study methods. Such explorations provided other suggestions for study. Additionally, add-on words and phrases referred to free/cost and language as well as educational level, source and location.

During failure times with the first computer, recourse was made to a Samsung G7 Prime mobile phone Model Number SM-G610F/DS but keypad size made access less easy than using the laptop keyboard. No attempt was made to use sound (vocal) input.

3. RESULTS

A thorough insight into a free world of education is seen from the Alison website (2020). Alison free learning has just signed up its 14 millionth learner from nearly 200 countries! This is a significant milestone for their free learning mission. It has over 1000 free courses available and hundreds of diploma graduates of courses worldwide, many studying and graduating from multiple courses. Although the courses are free, there may be a small charge for the final certificate.

Now it is possible to obtain free learning from some of the most prestigious universities in the world: Yale, Harvard, Boston, Oxford, London University and many others. Walker (2020) cites dozens of websites that are listed in the The Mind Unleashed. The sites are organized under the following headings: Business and Money,

Computer Science and Engineering, English and Communications, Foreign and Sign Languages, History and World Culture, Law, Mathematics, Multiple Subjects and Miscellaneous.

Online Learning programs may include the following techniques:

- pre- and post-module tests
- frequent tasks and activities
- 'stop and think' breaks
- fieldwork to be done away from desk or workplace
- interviews and fact-finding exercises
- broader questions and topics to think about and discuss
- case studies drawn from a range of countries
- suggestions for group discussions with friends and colleagues
- suggestions for further reading and study
- weekend or short full-time courses or workshops arranged by the providing group
- establishing or joining a virtual class group

For those who are beginning to think about Online Learning and who might wonder if they could cope, try using a short module in the field of humanitarian work. The module is called "Refugees and Internally Displaced Persons

(IDPs)" It can be downloaded from a free humanitarian website called www.networklearning.org (2021). This module will allow you to explore Online Learning without any outside commitment. It is self-assessed and covers an introduction to disaster terminology, the global disaster situation, the differences between refugees and IDPs, the Sphere Minimum Standards, the Deng Humanitarian Guiding Principles, and a case study from Sri Lanka. It will take about half an hour for completion.

If you would like to attempt a more advanced course that uses more of the techniques listed above, the following course will be available from the end of March 2021. Sphere's newly released e-learning course "Sphere in Practice" (2021) supports anyone who wishes to learn about humanitarian standards in an interactive and engaging way. This massive open online course (MOOC) includes assignments, moderated discussion forums and interactive webinars. Being part of the MOOC will help you exchange with fellow students, discuss with expert practitioners, expand your network and make the most of your learning experience.

Colleges offering Online Learning modules will normally provide guidelines on how to proceed. This is particularly important for those courses leading to professional registration. There will be indications of prerequisites (qualifications or other modules) if they are needed. Students

should obtain a copy of the guidelines and regulations and study them well so that deadlines and required conformities can be met.

Although there is no universal terminology for the components of academic programs, the following are in common but inconsistent use:

Definitions

1. **Program.** A collection of cognate courses leading to educational or professional qualifications. E.g., BSc, ITEC Massage Diploma

2. **Course.** A selection of modules (with appropriate pre-requisites and co-requisites) that can be followed in full-time, part-time or distance education mode, leading to a certificate, a diploma, or a degree (general and honors levels)

3. **Module.** A unit of theory, practical work/work experience, problem-solving exercises, assignments and assessments for a defined subject

4. **Precertificate Qualification.** Given to a student who has completed a course to bridge, for example, the 'O'L – 'A'L gap. (This is intended for students who have missed formal schooling at this level)

5. **Certificate Qualification.** Given to a student who has completed satisfactorily

a course equivalent to one year of full-time study

6. **Diploma Qualification.** Given to a student who has completed satisfactorily a course equivalent to two years of full-time study

7. **Degree (general) Qualification.** Given to a student who has completed satisfactorily a course equivalent to three years of full-time study post-secondary school

8. **Degree (honors) Qualification.** Given to a student who has completed satisfactorily a course equivalent to three or four years of full-time study post-secondary school

9. **Masters degrees** (MPhil, MSc, MEng) are usually equivalent to one or two years of full-time study.

10. **Doctorate degrees** (PhD or DPhil) are usually equivalent to three to five years of research although a Doctor of Science degree requires a significant contribution to research reflected in publications that may spread over many years

11. **Profile.** Several assessment/examination methods can be included. These tests may include final examinations (unseen, open book, unlimited time, seen questions with answers written under examination conditions), weighted contributions from practical work, assignments, and assessments from previous years, and profiles.

Profiling has been developed in many educational systems, and particularly by the Royal Society of Arts for its courses in the UK and elsewhere. Non-profiling systems usually involve the summation of marks from different sources and the sum is matched against predetermined standards. Profiles offer a range of assessments of the student under several headings of significance to employers. Here the final student assessment is expressed as graded statements under different headings, and not as a single category based upon a summation of results.

When embarking on an Online Learning course, the following questions need to be addressed with the help of the Internet:

- What subject would I like to study?
- Which institutions offer such courses?
- At what level should I study?
- How much will it cost?
- Will my family/friends be supportive of my activities? Will I be able to juggle study and family/social times?
- Is the subject relevant to my work? Is my boss sympathetic? Will s/he allow me to study in work time?
- Do I have the commitment to follow this path?

Some courses include or are entirely composed of a research project. Research does not necessarily mean ivory towers and expensive equipment. Fundamentally a researcher is a person who is curious and persistent enough to want to know what is happening, or how a system works, or how many, how much, where, when and by whom. There are basically two kinds of research:

1. **Descriptive Research**. This involves keeping records of what is happening. It needs pen and paper although a calculator or computer may help in tabulation and adding up results.

2. **Experimental Research**. This often arises from questions developed from descriptive research. What happens if we change something? That is the fundamental of experimental research.

Fundamental to all research is the formulation of a research question that is to be addressed. The question may well be supported by ancillary questions. No research project should be started without the construction of the questions(s) that will be addressed. Most colleges will help you through these stages through the completion of several forms and their guidelines. A full account of the ways to start a research project can be found in Walker (2020).

The most interesting course studied by Bill Gates is called Big History. The course originated in a university in Sydney, Australia, and it is divided into eight separate modules which "help to blur the boundaries between history and science". Gates liked the course so much that he is now funding it so that anyone can take it free and online. The modules should each take around an hour to complete, and you can study in your own time and at your own pace. It will take you on a journey through 13.7 billion years. Go to https://www.bighistoryproject.com/bhplive and click on Get Started.

Many large organizations, education Institutes and resource centers are moving towards Online access to their information. Increasingly, people around the world now work from home and will continue to do so even when the current pandemic is controlled.

In March 2020, The University of Hertfordshire Alumni Association (UK) wrote,

 "Following the recent COVID-19 (Coronavirus) outbreak…….
We have been reviewing the situation daily and last week various decisions were made including the move to online learning which came into effect from Monday 23 March…..

Due to the move to online learning….

We all have a role to play in keeping ourselves and each other safe and well, and we will continue to offer the high-quality teaching, learning and experience for all students and staff, albeit through new ways of working."

The Royal Society of Medicine said at the same time:

"We have also been working on developing the RSM education program and new ways to deliver education content while we are unable to host in-person events….

We have also been sourcing and testing a new digital platform which will allow us to continue delivering education activity….

A series of blogs and podcasts are also in production, and these will be shared with you to support your ongoing education and learning…. The **RSM Digital Library** *is accessible 24/7 where you can enjoy fast remote access from the comfort of your home or at work".*

Medical students in a London University have taken unsupervised exams from home for what could be the first time, as universities move to new ways of assessing final-year students. Postgraduate Masters and PhD students are now defending their theses through Skype or Zoom. Disadvantaged teenagers in many countries will be able to borrow laptops to help them study at home when schools are closed. The UK Department for Education is also supporting free Online lessons.

Of longer-term significance Harari, (a first-class graduate, doctorate and educator) said in 2016:

"Since we do not know what the job market will look like in 2030 or 40, already today we have no idea what to teach our kids. Most of what they currently learn at school will probably be irrelevant by the time they are forty.

Traditionally, life has been divided into two main parts: a period of learning followed by a period of working. Very soon the traditional model will become utterly obsolete, and the only way for humans to stay in the game will be to keep learning throughout their lives and to reinvent themselves repeatedly

4. **DISCUSSION**

Online Learning is developing at an unprecedented rate. Many courses, earlier only available through full-time schooling, can now be accessed through the Internet and free of charge although 'free course' providers may require payment for the qualifying certificate.

Some aspects of professional courses requiring technical and hands-on experience cannot be taught through computers. These include practical skills such as shoeing a horse, musical instrument performance (although theoretical music analysis can be learnt online); the physical techniques needed for learning anatomy, surgery, veterinary science and dentistry require the presence of an experienced practitioner to guide a student. One solution to such difficulties is to combine Online Learning with practical full-time workshops. In Ethiopia, a population of 84 million is served by only 1800 doctors, most in private practice. Now the Ethiopian Ministry of Health is developing a medical curriculum

supported by distance-learning. A Distance Learning Medical Centre has been established in Addis Ababa, Ethiopia (2021). It is already running an innovative curriculum, which includes practical clinical training based at the medical school, as well as attachments in rural and community centers. This is combined with study through learning materials and resources produced on The Open University model.

Online Learning is mainly individual. The absence of peer-pressure and timetables requires a different discipline and persistence. Self-imposed timetables need to be realistic and not over ambitious. Development of a study reflex is essential and can be achieved by always using the same location for study. Move a chair to the other side of a table and avoid locations used for other activities such as sleeping and eating. Self-reward with tea breaks and walks. Use travel and waiting times for revision: notes in mobile phones are fine for this. Other ideas will be included in the Recommendations Section.

Go back a generation and look in a school playground during breaktime. The children are skipping, playing chain-he and many ball games. They are exercising, learning to balance and gaining many social skills that will be needed later in life: team work, leadership, discussing, making decisions, coping with aggression and others. Now the scene has changed. Many children are obese and developing their thumbs as they play on

tabs and mobile phones. Parents and teachers need to compensate for such limitations but this is difficult in the isolation of lockdown.

Many adults no longer travel to work but they work from home: some from their beds. The physical and mental hazards that arise from this location are expounded in a BBC Review (2021). Turning your bed into your office can trigger a range of health problems, both psychological and physical. Adverse effects may be permanent and immediately manifested or could emerge later in life.

In a survey of 1,000 Americans 72% said they had worked remotely from their bed during the pandemic; a 50% increase since the start of the crisis. One in 10 reported they spent "most or all of their workweek" (24-to-40 hours or more) in bed. This is especially true of young workers; in the UK, those aged 18 to 34 are the least likely to have a proper desk and chair, and are twice as likely to work from bed than older workers.

Your neck, back, hips and more are all strained when you're on a soft surface that encourages you to slump or sprawl. "None of it is optimal," says Susan Hallbeck (2021), director of health-care-system engineering at the Mayo Clinic in the US. "You are not supported in a way that is conducive to work."

"As sleep specialists, we tend to recommend that the bed should be for the three Ss: Sleeping, Sex

or Sickness". (Rachel Salas (2021), associate professor of neurology and sleep expert at Johns Hopkins University in Maryland).

Working from bed for any extended period of time can lead to insomnia through the development of inappropriate reflexes.

Ergonomically, the working position should include a chair providing good back support that allows the arms to reach the keyboard horizontally at the level of your heart. The screen should be placed at right-angles to a window providing light. If intense light falls on the screen from behind or around it, the eye pupils try to shut out the external illumination while trying to open to allow maximum light from the screen. This can lead to eye strain and headaches. Some workers adopt the 20-20-20 rule: every 20 minutes look away from the screen and focus on an object at least 20 meters away for 20 seconds.

5. RECOMMENDATIONS

While some of the recommendations can be applied generically, they can all be applied specifically to Online Learning.

1. Plan your Aims and Objectives.

Aims are general and objectives are specific. Do not be too ambitious but set out your ideas in a diary. Your timetable will specify the details of your study times. Some ideas are outlined in the Results Section.

2. Appoint a Study-Buddy.

This person does not have to be a specialist in your area but s/he will follow your progress. You will need to negotiate with that person about precise roles and the provision of encouragement.

3. Change Passive to Active Learning.

Many educational systems around the world involve a teacher dictating notes that are learnt parrot fashion by the students to be regurgitated in examinations. Adopt the SQ3RMethod. This involves Survey, Question, Read, Recall and Review.

Survey the whole article/lesson to get an idea of its content. Glance at tables and figures noting especially lists of important points.

Question. This is most important. Look at headings and sub-headings and change them to questions. E.g., If the heading is "Factors affection tea plantation", change the statement to "What are the factors affecting tea plantation?" and search for answers.

Read at whatever speed is comfortable. In your own copy (and not in any library materials or those belonging to others) highlight with a pen what you think are important points.

Recall. Close the computer and try to recall what you have been reading. For maximum learning the recall should take place as soon as possible after reading. Write down your key learning points

Review. Finally read again looking carefully for the answers to the questions that you raised. Again, this should not be delayed to the period just before a test or examination. The sooner the better.

4. What to do if you get behind with your progress.

Check that you have set realistic goals. Inform your tutor and ask for guidance rather than inventing excuses. In the last resort you may need to complete some tasks at a lower standard than normal.

5. Change from Learning to Teaching. Any teacher will admit that more was learnt of a subject when teaching it than when learning it as a student. Use your Study-Buddy as a student and, without referring to this paper for example, teach about the SQ3R learning method.

6. CONCLUSIONS

Online Learning in a variety of formats has been used and developed during the last fifty years. The global pandemic has increased the use of tablets and computers while lockdowns have forced the need for more Online Learning. In future, the current model of a period of learning followed by employment is likely to change to intermittent learning periods throughout a working life. It was such thinking and analysis that prompted the production of this overview of Online Learning, a significant example of community resilience.

humanitarian career and while raising a family, he pushed further and obtained his PhD, also through Online Learning.

Without these people, others and organizations, many of which converted their traditional courses to Online Learning mode, this review would not have been produced. Its strengths are attributed to them: the weaknesses are mine.

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